

Influence of tetrahydrocurcumin on erythrocyte membrane bound enzymes and antioxidant status in experimental type 2 diabetic rats.

Murugan P, Pari L.

Source: Department of Biochemistry and Biotechnology, Faculty of Science, Annamalai University, Annamalai Nagar 608002, Tamil Nadu, India.

Abstract

Curcuma longa (Zingiberaceae) has been used traditionally as antidiabetic and has been proven scientifically to possess high antioxidant activity and anticancer properties. The active components of *Curcuma longa* such as curcumin and tetrahydrocurcumin (THC), a major colourless metabolite of curcumin also possesses antidiabetic, antiinflammatory and antioxidant activity. In the present study the effect of THC and curcumin on erythrocyte membrane bound enzymes and antioxidants activity in streptozotocin (STZ) and nicotinamide induced type 2 diabetic model was investigated. Oral administration of THC at 80 mg/kg body weight to diabetic rats for 45 days. The effect of THC and curcumin on glucose, insulin, haemoglobin, glycosylated haemoglobin, thiobarbituric acid reactive substances (TBARS), superoxide dismutase (SOD), catalase (CAT), glutathione peroxide (Gpx), glutathione-S-transferase (GST), reduced glutathione (GSH) and membrane bound enzymes were studied. The effect of THC was compared with curcumin. The levels of blood glucose, glycosylated haemoglobin, erythrocyte TBARS, were increased significantly whereas the level of plasma insulin and haemoglobin, erythrocyte antioxidants (SOD, CAT, GPx, GST and GSH), membrane bound total ATPase, Na(+)/K(+)-ATPase, Ca(2+)-ATPase, Mg(2+)-ATPase were decreased significantly in diabetic rats. Administration of THC and curcumin to diabetic rats showed decreased level of blood glucose, glycosylated haemoglobin and erythrocyte TBARS. In addition the levels of plasma insulin, haemoglobin, erythrocyte antioxidants and the activities of membrane bound enzymes also were increased in THC and curcumin treated diabetic rats. These biochemical observations were supplemented by histopathological examination of pancreas section. The present study indicates that the THC possesses a significant beneficial effect on erythrocyte membrane bound enzymes and antioxidants defense in addition to its antidiabetic effect.

PMID: 17693046 [PubMed - indexed for MEDLINE]